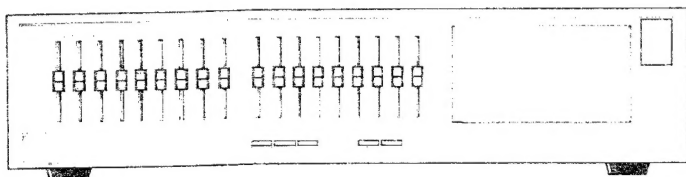


SERVICE MANUAL



EQ470R

Graphic Equalizer

 **Sherwood**

Specification

Equalizer Section

Equalizer Range

(Individual channel
adjust)..... $\pm 12\text{dB}$
63Hz, 125Hz, 250Hz, 500Hz,
1KHz, 2KHz, 4KHz, 8KHz, 16KHz

Total Harmonic Distortion

20Hz—20KHz, All Control;
Flat, Output: 1V..... 0.025%
1KHz, All Control;
Max. Output: 3V..... 0.06%
1KHz, All Control;
Flat, Output: 2V..... 0.005%
1KHz, All Control;
Min., Output: 0.2V..... 0.1%

Insertion Loss..... 0dB (Control; Flat)

Max. Output Voltage

(1KHz, THD: 0.5%,
RL 47K Ω)..... 10V

Frequency Response..... 10Hz—50KHz + 0—3dB

Signal to Noise Ratio

(IHF, A Network, short
circuited, 1V Output)..... 95dB

Input Impedance..... 50K Ω

Output Impedance..... 600 Ω

Miscellaneous

Power Consumption..... 12W

Dimensions..... 440(W) \times 95(H) \times 200(D)mm

Weight (without package)..... 3.3kg ()

Furnished Parts

Connection Cord with Pin

Plugs..... 2

Operating Instructions..... 1

NOTE:

Specification and the design subject to possible modification without notice due to improvements.

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Specification 1

Contents 2

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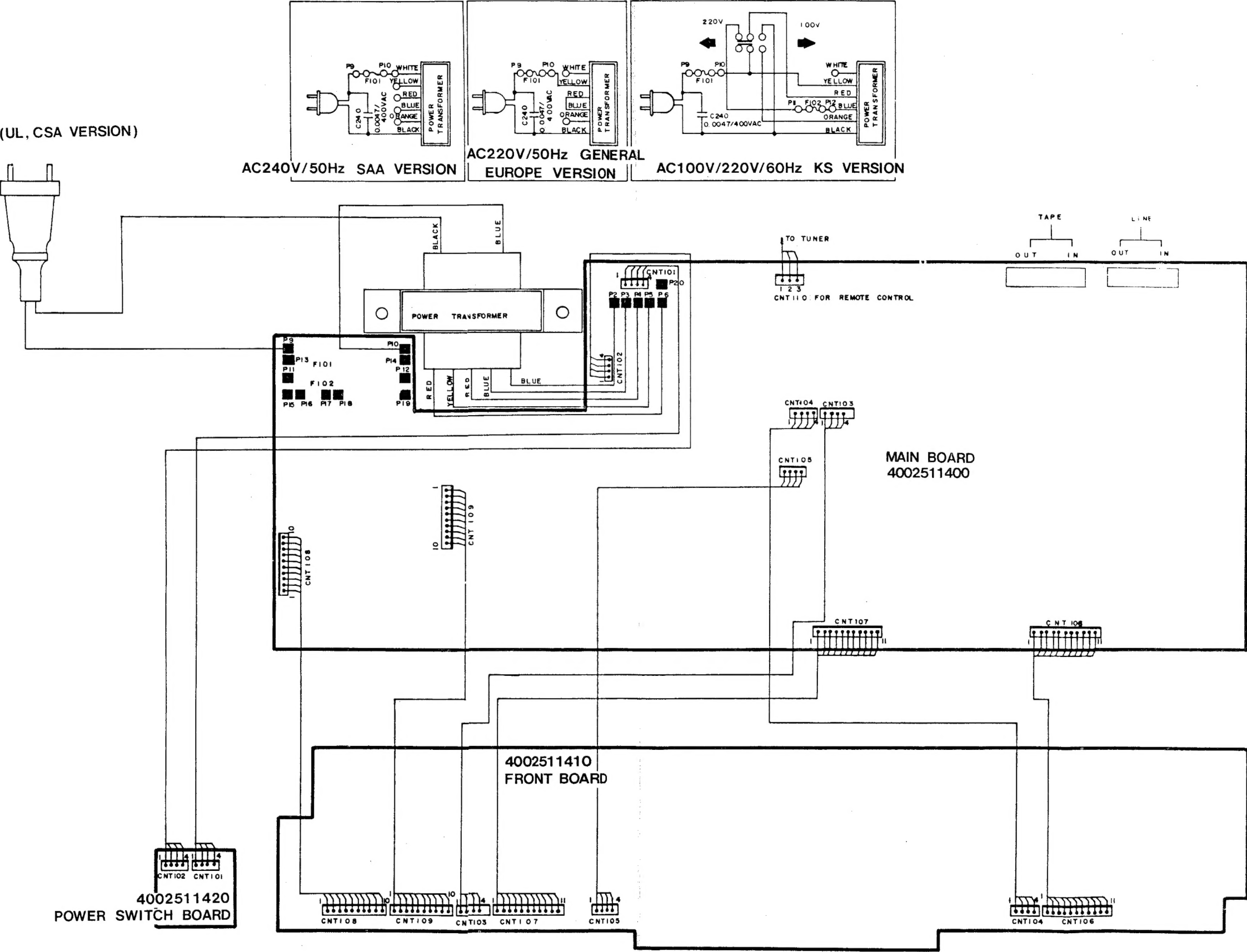
Parts List & Top View of p.c Boards..... 5.6.7.8

Part List & Exploded View of Cabinet & Chassis 9.10

Block Diagram..... 11

Point to Point Wiring Diagram

120V AC(UL, CSA VERSION)



Parts List & Top View of P.C Boards

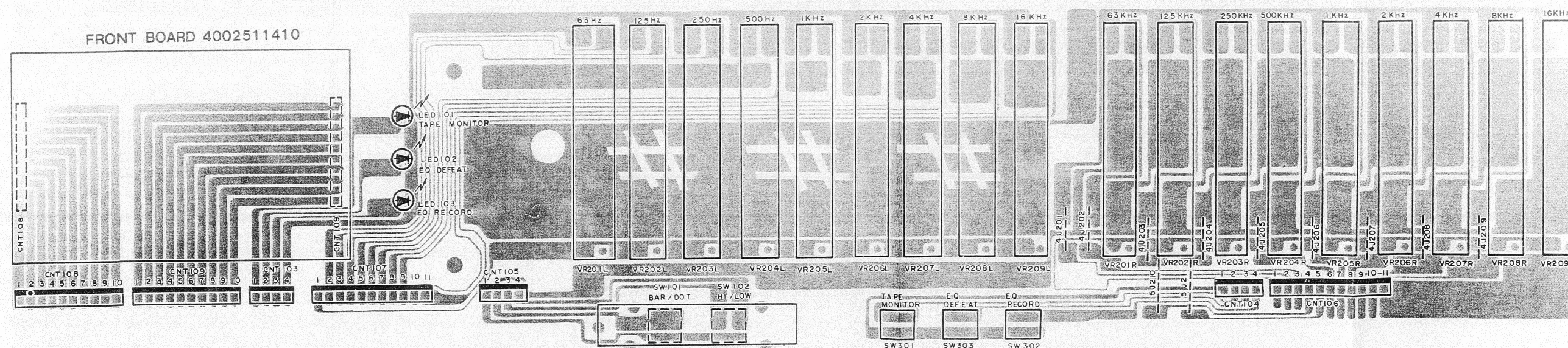
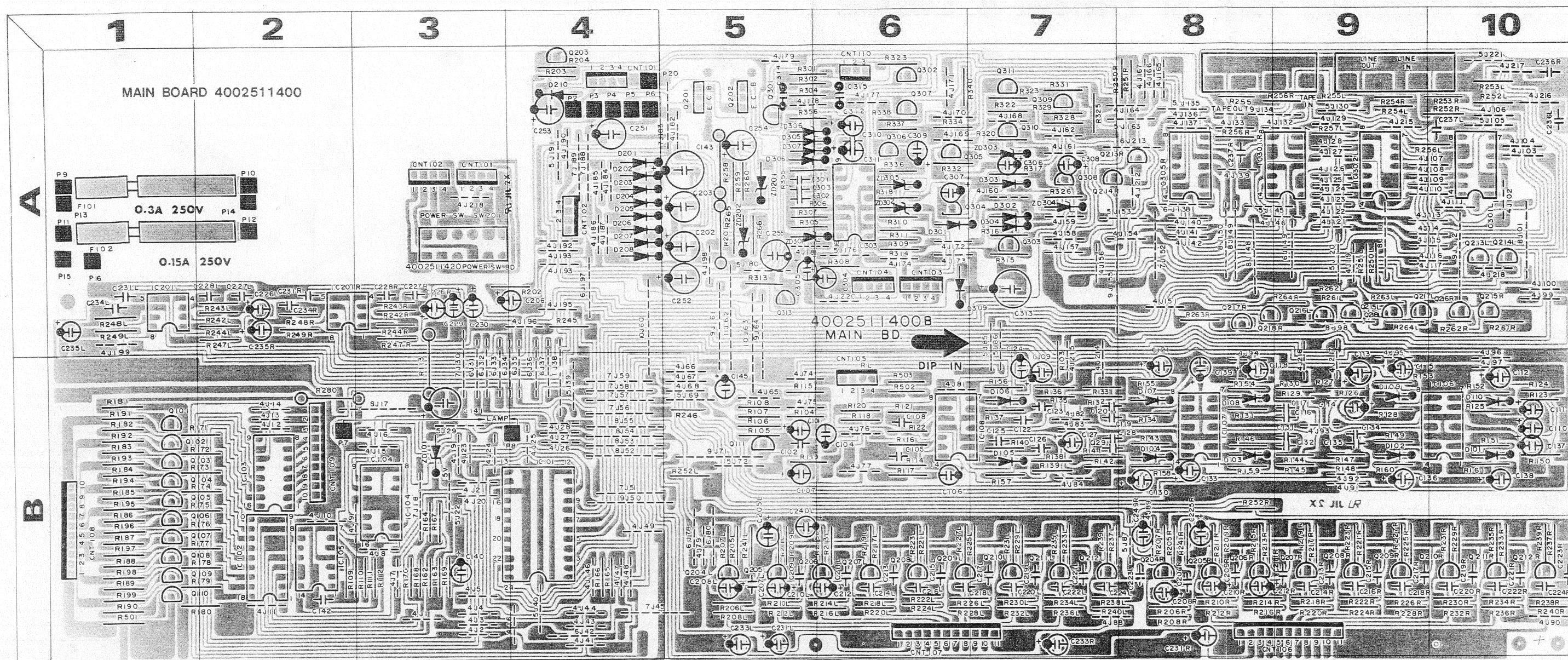
MAIN BOARD 4002511400

Ref.No.	Parts.No.	Description	Position
●IC			
IC101	2138009111	MC14067 BCP.	4B
IC102	2168024102	LM3915	2B
IC103	2108009112	74145	2B
IC104	2138009110	MC14029	3B
IC105	2138009109	MC14016	2B
IC106	2168000113	LM324	10B
IC107			8B
IC108			6,7B
IC301L/R	2138017108	LC4966	10A/9A
IC302L/R			9A/8A
IC303	2168007123	TC9130P	6A
IC201L/R	2168220103	NJM4560D	1A/2,3A
●TRANSISTOR			
Q101.Q102	2208206105	KTA1015	1B
Q103.Q104			
Q105.Q106			
Q107.Q108			
Q109.Q110			
Q201	2028406113	D880	5A
Q202	2028106111	B834	5A
Q203	2208206105	KTA1015	4A
Q204L/R	2208606109	KTC1815Y	5B/8B
Q205L/R			5B/8B
Q206L/R			6B/8,9B
Q207L/R			6B/9B
Q208L/R			6B/9B
Q209L/R			7B/9B
Q210L/R			7B/10B
Q211L/R			7B/10B
Q212L/R			7B/10B
Q213L/R			10A/8A
Q214L/R			10A/8A
Q215L/R			9A/10A
Q216L/R			9A/10A
Q217L/R			10A/8A
Q218L/R			9A/9A
Q301			5A
Q302			6A
Q303			7A
Q304.Q305			6,7A
Q306.Q307			6A
Q308.Q309			7A
Q310.Q311			7A
Q313			5A
●RESISTOR			
R103	3069101270	Carbon Film 100 ohm $\frac{1}{4}$ W	7A,B
R104	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	5,6B
R105	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	5B
R106	3069101270	Carbon Film 100K ohm $\frac{1}{4}$ W	5B
R107	3069103270	Carbon Film 10K ohm $\frac{1}{4}$ W	5B
R108	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	5B
R109	3069394270	Carbon Film 390K ohm $\frac{1}{4}$ W	3B
R110	3069134270	Carbon Film 130K ohm $\frac{1}{4}$ W	3B
R111.R112	3069203270	Carbon Film 20K ohm $\frac{1}{4}$ W	3B
R113	3039100472	Metal Oxide 10(1W)	3A,B
R114.R115	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	5,6B
R116	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	6B
R117	3069302270	Carbon Film 3K ohm $\frac{1}{4}$ W	6B
R118	3069223270	Carbon Film 22K ohm $\frac{1}{4}$ W	6B
R119	3069302270	Carbon Film 3K ohm $\frac{1}{4}$ W	5,6B
R120	3069223270	Carbon Film 22K ohm $\frac{1}{4}$ W	6B
R121	3069473270	Carbon Film 47K ohm $\frac{1}{4}$ W	6B
R122	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	6B
R123	3069203270	Carbon Film 20K ohm $\frac{1}{4}$ W	10B
R124	3069911270	Carbon Film 910K ohm $\frac{1}{4}$ W	10B
R125	3069683270	Carbon Film 68K ohm $\frac{1}{4}$ W	10B
R126	3069203270	Carbon Film 20K ohm $\frac{1}{4}$ W	9B
R127	3069132270	Carbon Film 1.3K ohm $\frac{1}{4}$ W	9B
R128	3069623270	Carbon Film 62K ohm $\frac{1}{4}$ W	9B
R129	3069203270	Carbon Film 20K ohm $\frac{1}{4}$ W	9B
R130	3069122270	Carbon Film 1.2K ohm $\frac{1}{4}$ W	9B
R131	3069513270	Carbon Film 51K ohm $\frac{1}{4}$ W	8B
R132	3069183270	Carbon Film 18K ohm $\frac{1}{4}$ W	7,8B
R133	3069911270	Carbon Film 910K ohm $\frac{1}{4}$ W	7,8B
R134	3069473270	Carbon Film 47K ohm $\frac{1}{4}$ W	8B
R135	3069183270	Carbon Film 18K ohm $\frac{1}{4}$ W	7B

Ref.No.	Parts.No.	Description	Position
R136	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	7B
R137	3069513270	Carbon Film 51K ohm $\frac{1}{4}$ W	7B
R138	3069203270	Carbon Film 20K ohm $\frac{1}{4}$ W	7B
R139	3069112270	Carbon Film 1.1K ohm $\frac{1}{4}$ W	7B
R140	3069563270	Carbon Film 56K ohm $\frac{1}{4}$ W	7B
R141	3069243270	Carbon Film 24K ohm $\frac{1}{4}$ W	7,8B
R142	3069132270	Carbon Film 1.3K ohm $\frac{1}{4}$ W	7,8B
R143	3069623270	Carbon Film 62K ohm $\frac{1}{4}$ W	8B
R144	3069203270	Carbon Film 20K ohm $\frac{1}{4}$ W	9B
R145	3069122270	Carbon Film 1.2K ohm $\frac{1}{4}$ W	9B
R146	3069683270	Carbon Film 68K ohm $\frac{1}{4}$ W	8B
R147	3069273270	Carbon Film 27K ohm $\frac{1}{4}$ W	9B
R148	3069132270	Carbon Film 1.3K ohm $\frac{1}{4}$ W	9B
R149	3069513270	Carbon Film 51K ohm $\frac{1}{4}$ W	9B
R150	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	10B
R151	3069563270	Carbon Film 56K ohm $\frac{1}{4}$ W	10B
R152	3069222270	Carbon Film 2.2K ohm $\frac{1}{4}$ W	10B
R153			9B
R154.R155			8B
R156.R157			7B
R158.R159			8B
R160			9B
R161			10B
R162	3069471270	Carbon Film 470K ohm $\frac{1}{4}$ W	3B
R163	3069103270	Carbon Film 10K ohm $\frac{1}{4}$ W	3B
R164	3069331270	Carbon Film 330K ohm $\frac{1}{4}$ W	3B
R165	3069473270	Carbon Film 47K ohm $\frac{1}{4}$ W	4B
R166	3069224270	Carbon Film 220K ohm $\frac{1}{4}$ W	4B
R167	3069560270	Carbon Film 56K ohm $\frac{1}{4}$ W	3B
R168	3069161270	Carbon Film 160K ohm $\frac{1}{4}$ W	3B
R169	3069751270	Carbon Film 750K ohm $\frac{1}{4}$ W	3B
R170	3069331270	Carbon Film 330K ohm $\frac{1}{4}$ W	3B
R171.R172	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	1,2B
R173.R174			
R175.R176			
R177.R178			
R179.R180			
R181.R182			
R183.R184			
R185.R186			
R187.R188			
R189.R190			
R191.R192	3069561270	Carbon Film 560K ohm $\frac{1}{4}$ W	1B
R193.R194			
R195.R196			
R197.R198			
R199.R501			
R502.R503	3069122270	Carbon Film 1.2K ohm $\frac{1}{4}$ W	6B
R201	3039100472	Metal Oxide 10 ohm1WJ	5A
R202	3069100270	Carbon Film 10 ohm $\frac{1}{4}$ W	4A
R203	3069223270	Carbon Film 22K ohm $\frac{1}{4}$ W	4A
R204	3069103270	Carbon Film 10K ohm $\frac{1}{4}$ W	4A
R205L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	5B/8B
R206L/R	3069122270	Carbon Film 1.2K ohm $\frac{1}{4}$ W	5B/8B
R207L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	5B/8B
R208L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	5B/8B
R209L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	5B/8B
R210L/R	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	5B/8B
R211L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	5B/8B
R212L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	5B/8B
R213L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	6B/9B
R214L/R	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	6B/8,9B
R215L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	6B/8B
R216L/R	3969153270	Carbon Film 15K ohm $\frac{1}{4}$ W	6B/8,9B
R217L/R	3969104270	Carbon Film 100K ohm $\frac{1}{4}$ W	6B/9B
R218L/R	3069122270	Carbon Film 1.2K ohm $\frac{1}{4}$ W	6B/9B
R219L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	6B/9B
R220L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	6B/9B
R221L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	6B/9B
R222L/R	3069112270	Carbon Film 1.1K ohm $\frac{1}{4}$ W	6B/9B
R223L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	6B/9B
R224L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	6B/9B
R225L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	7B/9B
R226L/R	3069112270	Carbon Film 1.1K ohm $\frac{1}{4}$ W	7B/10B
R227L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	7B/9B
R228L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	7B/10B
R229L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	7B/10B
R220L/R	3069122270	Carbon Film 1.2K ohm $\frac{1}{4}$ W	7B/10B
R231L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	7B/10B
R232L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	7B/10B
R233L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	7B/10B

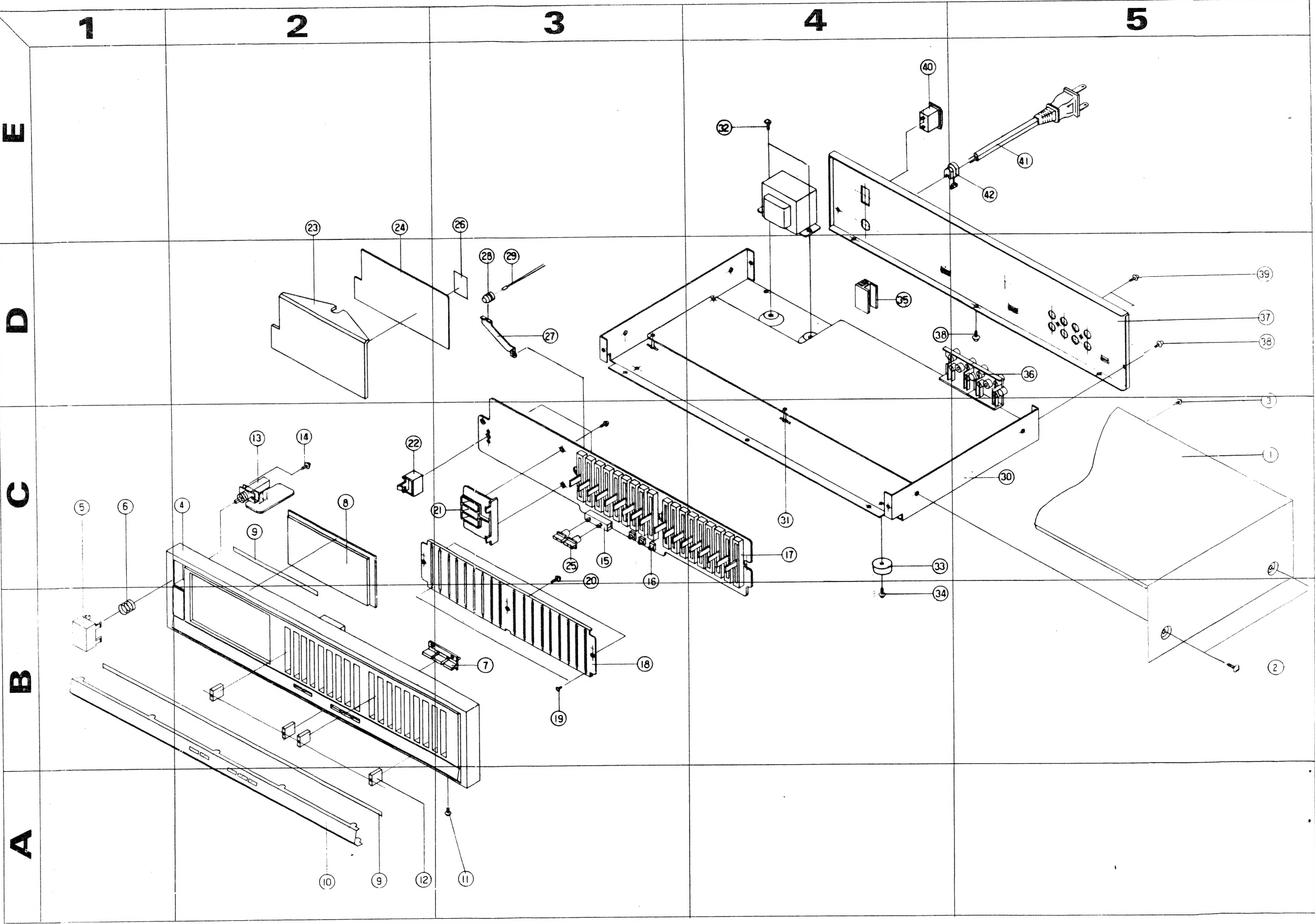
Ref No	Parts No.	Description	Position
R234L/R	3069122270	Carbon Film 1.2K ohm $\frac{1}{4}$ W	7B/10B
R235L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	7B/10B
R236L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	7B/10B
R237L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	8B/10B
R238L/R	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	8B/10B
R239L/R	3069391270	Carbon Film 390 ohm $\frac{1}{4}$ W	7B/10B
R240L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	8B/10B
R241L/R	3069101270	Carbon Film 100K ohm $\frac{1}{4}$ W	5B/8B
R242L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	2A/3A
R243L/R	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	2A/3A
R244L/R			2A/3A
R245.R246	3069101270	Carbon Film 100 ohm $\frac{1}{4}$ W	4A/5B
R247L/R	3069153270	Carbon Film 15K ohm $\frac{1}{4}$ W	2A/3A
R248L/R			1A/2A
R249L/R	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	
R250L/R	3069332270	Carbon Film 3.3K ohm $\frac{1}{4}$ W	8A/9A
R251L/R			
R252L/R	3069101270	Carbon Film 100 ohm $\frac{1}{4}$ W	5B/8B
R253L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	10A
R254L/R			8A/9A
R255L/R	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	9A/10A
R256L/R	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	8A/9A
R257L/R	3039100372	Carbon Film 10(1W)	5A
R258	3069561270	Carbon Film 560 ohm $\frac{1}{4}$ W	
R259	3069101270	Carbon Film 100K ohm $\frac{1}{4}$ W	9A/10A
R260	3069332270	Carbon Film 3.3K ohm $\frac{1}{4}$ W	
R261L/R			
R262L/R			10A/8A
R263L/R			9A
R264L/R	3069561270	Carbon Film 560 ohm $\frac{1}{4}$ W	5A
R265	3069101270	Carbon Film 100 ohm $\frac{1}{4}$ W	
R266	3069103270	Carbon Film 10K ohm $\frac{1}{4}$ W	5,6A
R301	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	
R302	3069103270	Carbon Film 10K ohm $\frac{1}{4}$ W	6A
R303	3069104270	Carbon Film 100K ohm $\frac{1}{4}$ W	5,6A
R304			
R305.R310			
R307	3069103270	Carbon Film 10K ohm $\frac{1}{4}$ W	6A
R308	3069102270	Carbon Film 1K ohm $\frac{1}{4}$ W	
R309			
R311	3069331270	Carbon Film 330 ohm $\frac{1}{4}$ W	5A
R313	3069103270	Carbon Film 10K ohm $\frac{1}{4}$ W	6A
R314			7A
R315			
R316	3069223270	Carbon Film 22K ohm $\frac{1}{4}$ W	
R317			
R318	3069474270		6A
R320	3069223270	Carbon Film 470K ohm $\frac{1}{4}$ W	7A
R322	3069474270	Carbon Film 22K ohm $\frac{1}{4}$ W	
R323	3069223270	Carbon Film 470K ohm $\frac{1}{4}$ W	
R325	3069474270	Carbon Film 22K ohm $\frac{1}{4}$ W	
R326	3069223270	Carbon Film 470K ohm $\frac{1}{4}$ W	
R328	3069474270	Carbon Film 22K ohm $\frac{1}{4}$ W	
R329	3069223270	Carbon Film 470K ohm $\frac{1}{4}$ W	
R331	3069474270	Carbon Film 22K ohm $\frac{1}{4}$ W	
R332	3069223270	Carbon Film 470K ohm $\frac{1}{4}$ W	6,7A
R334	3069223270	Carbon Film 22K ohm $\frac{1}{4}$ W	6A
R336	3069474270	Carbon Film 470K ohm $\frac{1}{4}$ W	
R337	3069223270	Carbon Film 22K ohm $\frac{1}{4}$ W	
R338	3069474270	Carbon Film 470K ohm $\frac{1}{4}$ W	
R340	3069223270	Carbon Film 22K ohm $\frac{1}{4}$ W	7A
●CAPACITOR			
C101	3479210971	Elect AFSA 1/50	5,6B
C102	3579471130	Ceramic 470P	
C104	3479210971	Elect AFSA 1/50	6B
C105	3579471130	Ceramic 470P	
C106.C107	3479247971	Elect AFSA 4.7/50	5,6B
C108	3579470130	Ceramic 47P	6B
C109	3479222041	Elect AFSA 22/25	7B
C110.C111	3479233871	Elect AFSA 0.33/50	10B
C112	3479210971	Elect AFSA 1/50	
C113.C114	3479215871	Elect AFSA 0.15/50	9B
C115	3479210971	Elect AFSA 1/50	
C116.C117	3679823120	Mylar 0.082 μ F	
C118	3479210971	Elect AFSA 1/50	8,9B
C119.C120	3679473120	Mylar 0.047 μ F	7,8B
C121	3479210971	Elect AFSA 1/50	8B
C122.C123	3679223120	Mylar 0.022 μ F	7B
C124	3479210971	Elect AFSA 1/50	
C125.C126	3679103120	Mylar 0.01 μ F	

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Parts List & Exploded View of Cabinet & Chassis

NO.	PARTS NO.	DESCRIPTION	Q'TY	POSITION
1	046122011711	COVER TOP	1	C6
2	8159440083	SCREW WPS4 × 8(B)	4	B6
3	8119430053	SCREW PS3 × 5(B)	1	D6
4	048501005711	PANNEL FRONT	1	C2
5	048545025611	BUTTON PUSH(POWER)	1	C1
6	6555601020	SPRING COIL	1	C1
7	8545033810	BUTTON TACT	1	B3
8	8555013010	WINDOW L.E.D	1	C2
9	1858400103	TAPE DOUBLE W-5	1	C2, A2
10	048633001111	PLATE NAME	1	A2
11	8119430053	SCREW PS3 × 5(B)	3	A3
12	048545032011	KNOB SLIDE	18	A2
13	4628043610	S/W PUSH(POWER)	1	C2
14	8119130081	SCREW #1PT 3 × 8(Y)	2	C2
15	4628040410	S/W PUSH (2KEY)	1	C3
16	4658001120	S/W TACT	3	C3
17	3238406410	SLVR 4518 PB	18	C4
18	6503008310	B.K.TE.Q	1	B3
19	3019120033	SCREW PM2 × 3(B)	20	B3
20	8119130081	SCREW #1RT 3 × 8(Y)	6	C3
21	8523007710	DESCORATION L.E.D	1	C3
22	6515008810	HOLDER REFLECTOR	1	C2
23	048555012811	REFLECTOR L.E.D	1	E2
24	048535010011	INLAY DECORATIOO	1	E2
25	8545033910	BUTTON PUSH	2	C3
26	8535011110	DIFFUSER	1	E3
27	6515008910	HOLDER LAMP	1	A3
28	6715010410	LAMP HOLDER	1	D3
29	2528201420	LAMP	1	D3
30	6122612410	CHASSIS MAIN	1	C5
31	6528300310	FASTNER	4	C4
32	8159440081	SCREW WPS 4 × 8(Y)	2	E4
33	6335000310	FOOT	4	C4
34	8119430081	SCREW WPS 3 × 8(Y)	4	B4
35	7505201920	HEAT SINM REG TR	1	D4
36	4438100410	JACK R.C.A.	1	D5
37	046102018112	CHASSIS BACK	1	D6
38	8119430053	SCREW PS 3 × 5(B)	5	D5, D6
39	8119130083	SCREW #1PT 3 × 8(B)	2	D6
40	4308000220	CORD AC POWER	1	E5
41	6518000111	STOPPER CORD	1	E5





KV123C



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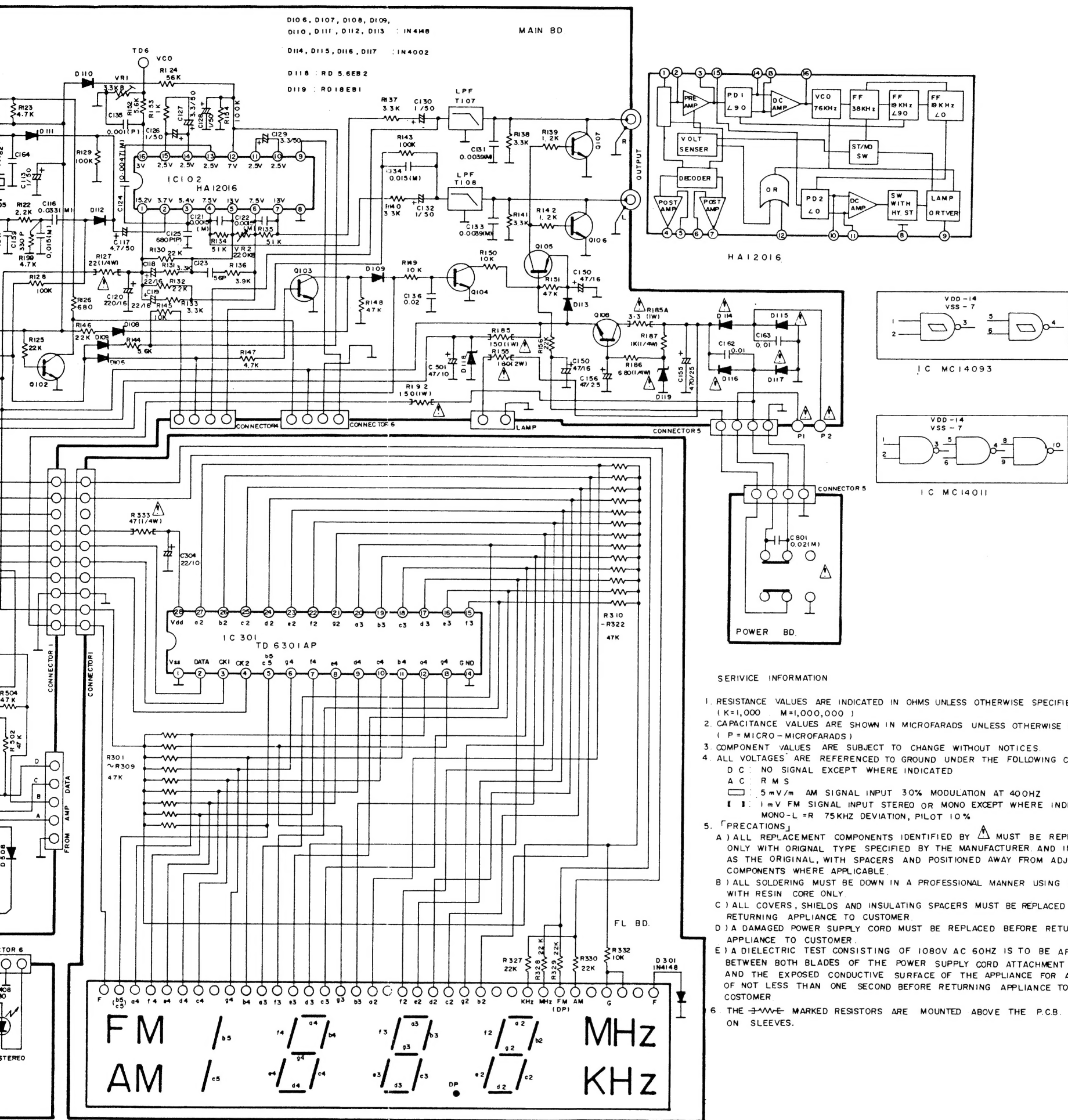
KV1230



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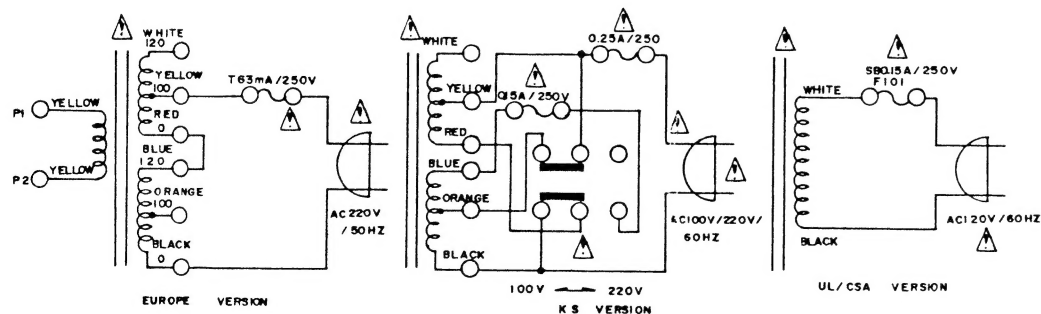
Schematic Diagram

TD140R



SERVICE INFORMATION

1. RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED.
(K=1,000 ; M=1,000,000)
2. CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED.
(P=MICRO-MICROFARADS)
3. COMPONENT VALUES ARE SUBJECT TO CHANGE WITHOUT NOTICES.
4. ALL VOLTAGES ARE REFERENCED TO GROUND UNDER THE FOLLOWING CONDITIONS:
D C : NO SIGNAL EXCEPT WHERE INDICATED
A C : R M S
5 mV/m AM SIGNAL INPUT 30% MODULATION AT 400HZ
1 mV FM SIGNAL INPUT STEREO OR MONO EXCEPT WHERE INDICATED
MONO-L=R 75KHZ DEVIATION, PILOT 10%
5. PRECAUTIONS:
A) ALL REPLACEMENT COMPONENTS IDENTIFIED BY Δ MUST BE REPLACED ONLY WITH ORIGINAL TYPE SPECIFIED BY THE MANUFACTURER AND INSTALLED AS THE ORIGINAL, WITH SPACERS AND POSITIONED AWAY FROM ADJACENT COMPONENTS WHERE APPLICABLE.
B) ALL SOLDERING MUST BE DOWN IN A PROFESSIONAL MANNER USING SOLDER WITH RESIN CORE ONLY.
C) ALL COVERS, SHIELDS AND INSULATING SPACERS MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER.
D) A DAMAGED POWER SUPPLY CORD MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER.
E) A DIELECTRIC TEST CONSISTING OF 1080V AC 60HZ IS TO BE APPLIED BETWEEN BOTH BLADES OF THE POWER SUPPLY CORD ATTACHMENT PLUG AND THE EXPOSED CONDUCTIVE SURFACE OF THE APPLIANCE FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING APPLIANCE TO CUSTOMER.
6. THE Δ -MARKED RESISTORS ARE MOUNTED ABOVE THE P.C.B. ON SLEEVES.



Block Diagram

